



# A HISTORY OF ACHIEVEMENT U. S. NAVY... AND ...SIKORSKY AIRCRAFT

## FROM THE PS-1 TO THE CH-53E

Sikorsky Aircraft's association with the U.S. Navy began long before the Navy's use of helicopters. The S-38, a twin-engine amphibian, was the first Sikorsky-manufactured aircraft to see Navy service. Powered by Wright J-5 engines, it was delivered to the Navy in 1927 and designated the XPS-1. Two more Sikorsky amphibians, S-38A's, were delivered in 1928 and designated XPS-2's. The two XPS-2's were transferred to Utility Squadron One (VJ-1B) at Aroostook, Maine, in 1929. Four additional amphibians, designated PS-3's (Sikorsky S-38B's), were delivered between 1929 and 1932.



In 1930, three S-41's were delivered to the Navy as RS-1 transport aircraft. At the same time, the PS-2's and PS-3's, redesignated as RS-2s and -3s, saw service in Navy and Marine Corps units at home and overseas.

In 1935, the first four-engine flying boat PBS-1 (BUNO 9995) was ordered. Delivered in 1937, it was powered by four 1,050 hp Pratt & Whitney R-1830-68 engines and was the first American military aircraft with tail, nose and two waist turrets.

Seventeen S-43 twin-engined amphibians were delivered to the Navy and Marine Corps between 1937 and 1939. Designated the JRS-1, these aircraft served in Marine Squadrons VMJ-1 and VMJ-2 and Navy Utility Squadron One (VJ-1) at San Diego.

Later came the Vought-Sikorsky SB2U Vindicator, OS2U Kingfisher, and most famous of all, the F4U Corsair of World War II fame.

The headline of a feature story in the April 23, 1943, New York Times read: HELICOPTER HAILED AS CURB ON U-BOATS. This story had been revealed to members of the National Newspaper Promotion Association the night before by Captain Leland P. Lovett, U.S. Navy Public Relations Chief. He had said that the helicopter, operating from

ships, was "the aircraft best suited to do the job" of closing the 500-mile gap in the Atlantic where German U-boats were taking their biggest toll.

This was the U.S. Navy's first statement concerning the use of helicopters for combating enemy submarines. It was also the prelude to the long helicopter relationship between the Navy and Sikorsky Aircraft.



The idea of employing the helicopter in Navy service originated in 1916, but it was not until October 30, 1943, that the Navy received its first helicopter, the Sikorsky HNS (R-4). This aircraft, Sikorsky No. 11, was received at the Vought-Sikorsky Stratford plant by Commander Frank Erickson and delivered to the Navy's Coast Guard station at Floyd Bennett Field in New York. (At this time, USCG command had been transferred from the Treasury Dept. to the Navy Dept.) Throughout the war, Sikorsky helicopters, first the HNS, and then the HOS (R-6) and HO2S (R-5), were used for rescue-patrol missions.

The first ASW hunter-killer group was formed in 1943 in an effort to provide an offensive capability in the Battle of the Atlantic. The group, composed of escort carriers, destroyers, destroyer escorts, and fixed-wing aircraft, proved its worth. In collaboration with other rapidly formed groups, the ASW team helped make once-hazardous sea lanes safe for allied ships. Following the war, the U.S. Navy continued to improve its ASW defenses. But detecting the sub was now a greater problem because of the introduction of the snorkel. The ASW fixed-wing aircraft could establish a contact, but had great difficulty in reestablishing a contact if the sub evaded its initial attack. And the "time late" of destroyers vectored to the point of last known contact often precluded gaining contact with sonar. At this point,

the Navy turned to the helicopter—the only airborne vehicle adaptable to placing an active sonar in the water to detect a fully-submerged sub and, at the same time, capable of reducing “time late” to datum.

## XHOS AND XCF

In 1946 the U.S. Naval Research Laboratory coupled the Sikorsky XHOS (R-6) with the Hayes XCF underwater sound system in the first helicopter sonar dipping tests. The equipment was rudimentary, but the concept provided a basis for the refined detection systems employed today. At the same time, the Navy established a new squadron, Helicopter Development Squadron VX-3, to develop and evaluate helicopters for search and rescue work. The helicopter was then used to replace fixed-wing aircraft performing ship-to-shore and utility duties. (VX-3 was deactivated and divided into two Helicopter Utility Development Squadrons—HU-1 at Miramar, Calif., and HU-2 at Lakehurst, N.J., in April, 1948, to increase the flexibility of Navy helicopter programs.)

Applications of Sikorsky helicopters continued to increase throughout the Navy during the early post-war years, particularly in 1947. In January, Sikorsky HO3S's (S-51's) were operated from the deck of the 6000-ton USCG ice breaker North Wind WAGB-282, which accompanied Rear Admiral Richard E. Byrd on his antarctic expedition. While the fleet sliced its way through the frozen sea, the HO3S's operated high overhead, spotting paths in the ice and relaying this information to the ship.

In February, the Navy announced plans to evaluate helicopters for performing plane guard duty from aircraft carriers. An HO3S on maneuvers that spring with the Atlantic Fleet proved its value by rescuing LCDR George Stablien from his SB-2C Helldiver, which had crashed alongside the carrier Franklin D. Roosevelt. Before the exercise had ended, the HO3S had rescued five other pilots who had made forced landings in the sea. All told, it made 154 flights, carried 231 passengers, flew 98 mail runs, and took part in 19 plane guard operations. More impressive was the fact that the HO3S logged 62 flight hours in 33 days—even when all other aircraft were grounded for five days because of weather or rough seas.

## NAVY INCREASES HELICOPTER FLEET

In early 1948, the Navy took a gigantic forward stride toward building a helicopter fleet it labeled “second to none.” Twenty HO3S's were ordered as part of the Navy's plan to increase its fleet to 100 helicopters. The HO3S's were slated for rescue and troop-cargo carrying roles. At the same time, they began to test the Sikorsky experimental XHJS-1, an aircraft designed for rescue and observation work while operating from carriers, battleships, and cruisers. This was the first helicopter with all-metal rotor blades. Other helicopter improvements devised in 1947-48 by the Navy Experimental Research Center included HO3S tip blade lights for flying at night, and a flotation system composed of four rubberized bags.

As improvements in submarine technology began to outpace submarine countermeasures, the U.S. Navy Air Development Squadron One (VX-1) in 1949 began to develop an improved sonar system, the AQS-1, at Key West, Florida. This successful program prompted CNO to authorize further development of an improved helicopter-sonar system.

## KOREA AND THE NAVY HELICOPTER

While this program was in progress little more than a year, U.S. Navy HO3S's were called to action on the Korean battle front. It was here that Navy helicopter pilots, operating from ships that skirted the Korean peninsula, were called upon time and again to rescue fixed-winged pilots who had had to ditch in the sea. As the war progressed, these same pilots ferried wounded from field hospitals hastily erected on the front to hospital ships off the coast. (One such ship, the USS Haven, handled 13,000 patients in 20 months. It accomplished this feat by operating close to shore, where the battle was being waged. Patients were flown directly from the front line to the ship, expediting treatment.)



Other HO3S pilots were assigned to equally important roles—spotting for ship-to-land bombardment of enemy gun positions, troop emplacements, mines; plane guard duty; and carrying doctors to the front line. In 1951, when 120 Thailand sailors and nine Americans were marooned on a beach deep in enemy territory, Navy HO3S pilots proved their mettle by bringing the 129 back to the safety of the cruiser USS Manchester.

For this and similar types of activities, Vice Admiral C. Turner Joy, Commander Naval Forces-Far East, said, “If any single type of aircraft has sold itself to the entire Navy and Marine Corps by superior performance in the field, it has been the helicopter ... the eyes of the fleet ...”



But the eyes of the fleet had to be guided by hands, steady hands, and these were provided by Navy pilots. One such pair of steady hands belonged to a Navy HO3S pilot who was jumped by three, speedy Russian-built MIGs in late 1950, but managed to outmaneuver them by flying at low levels until he had reached the safety of the USS Valley Forge. Another pair belonged to Lt. (j.g.) Paul J. Myatt, pilot of an HO3S known as "Old Dad II." While at 6000 feet above North Korea and 45 miles from home, Myatt had a rotor blade damaged by a 20 mm shell, but managed to fly his unsteady craft to safety. Steady hands were also the chief forte of the HO3S pilots of HU-1 who, while celebrating in 1953 the fifth anniversary of the formation of their unit, had surpassed the 450 rescue mark. The only Navy helicopter squadron still operating in Korea when their anniversary rolled around, HU-1 had supported every major ship in the Far East. Each HU-1 unit, composed of two pilots and six crewmen, had been assigned to duties on American ships, British carriers, Korean islands, even small LSTs and ice breakers. For their bravery, four HU-1 HO3S pilots were awarded the Navy's second highest medal, the Navy Cross. Several Silver Star medals were awarded and the squadron itself received the coveted Presidential Unit Citation.

## THE HOME FRONT IN THE 1950s: ASW-MINDED

While HO3S pilots were writing history in Korea, the helicopter-sonar marriage for ASW operations received a major boost in 1951 when the Navy received its first Sikorsky HO4S-1 (S-55) and AN/AQS-4 sonar. This project, completed under Cdr. J.A.H. Torry in 1952, involved evaluating the sonar's capability to detect fleet and guppy-type subs, developing helicopter screening tactics, controlling screens by destroyers and carriers, and evaluating the helicopter's ability to operate from an LST.

In 1952, Helicopter ASW Squadron One (HS-1) was formed at Key West. Along with VX-1, HS-1 pilots helped develop helicopter ASW tactics. Subsequently, the HO4S, with an improved engine to meet the rugged requirements of the ASW mission, was introduced to HS-1 and all other ASW helicopter units. This aircraft became the first helicopter permanently assigned to U.S. Navy ASW work.

Meanwhile, Navy research personnel had developed an automatic pilot for the HO4S, a device which would prove to be most valuable for pilots flying the taxing ASW mission. The success of ASW HS squadrons using the HO4S and AQS-4 combination prompted BuAer to seek a more powerful helicopter, one built specifically for anti-submarine warfare missions.

## THE SH-34G (HSS-1)

Sikorsky Aircraft built the SH-34G, originally known as the HSS-1, in 1954. After extensive evaluations from the carrier Kula Gulf, this aircraft was selected over competitors in March, 1955, as the U.S. Navy's first helicopter to be built specifically for ASW operations. In October, the carrier Siboney, its decks loaded with 13 Sikorsky/Navy helicopters, was rushed to Tampico, Mexico, to perform a role familiar to the Sikorsky helicopter—rescue of civilians imperiled by flood. These helicopters more than rose to meet the challenge. When the operation was ended, they had plucked 9262 survivors from the water. Countless thou-

sands were saved by landing Mexican medical teams on water-encircled high ground. In 164 other missions, they delivered 197 tons of food to points which only they could reach. When major floods hit Connecticut in 1955, Navy Lt. G. Bello, on temporary duty at Sikorsky Aircraft, upped the Navy's rescue record by making 249 saves.

In 1956, while the HSS-1 was being delivered to Navy units on both coasts of the United States, it became the first helicopter to be qualified by the Navy for instrument flight operations. The newly-formed Helicopter Squadron Five was equipped entirely with SH-34G's, giving it the most advanced helicopters available. Navy helicopter squadrons training and experimenting with ASW techniques numbered nine when ASW Helicopter Squadron HS-9 was commissioned on June 1, 1956, at NAS Quonset Point, R.I. At the same time, SH-34G's of HS-4 were being employed in the Far East—the first time a U.S. Navy ASW squadron equipped with helicopters had entered Asian waters. This marked the beginning of increased global striking and defensive power for U.S. Navy ASW helicopter forces. From that time Sikorsky-built ASW helicopters have continuously patrolled the seven seas.

## TESTING TO FIND THE RIGHT ANSWERS

It was clear in the early 1950's that the helicopter was to play an increasingly important role in fleet service. Its role in ASW tactics was established. The airborne mine countermeasures mission, which had an obscure beginning with Sikorsky/Navy HO3S's in the Korean War, was soon given increasing importance. Sikorsky Aircraft entered this field in 1953 by designing a tow boom and hook for the HO4S. This led to the commencement of U.S. Navy towing experiments and the formation of the Naval Air Mine Defense Development Unit (NAMDDU) at Panama City, Florida. The airborne MCM concept gathered impetus as Sikorsky and the Navy worked cooperatively on studies and designs of tow gear and specialized installations to detect and classify mines. Actually, the SH-34G entered this field in 1954, prior to its permanent assignment to ASW missions. Although it was not physically employed for towing, an analytical study of its tow capability led to further use of Sikorsky helicopters in MCM operations.

The Navy continued to experiment with Sikorsky helicopters to find the right helicopter for the right mission. In late 1956, the Navy utilized its first of two experimental HR2S (S-56) helicopters in an operation to extend a fleet's early warning coverage beyond that of shipboard radar. The helicopter, equipped with search radar, operated from a carrier.

The Navy Bureau of Aeronautics was also laying the groundwork for the future generation of turbine-powered helicopters by flight testing a twin-turbine-powered SH-34G. Known as the HSS-1F, this helicopter was equipped with the T-58 gas turbine used in today's SH-3H ASW aircraft. And, at Indian Springs AFB, Nevada, the Naval Air Special Weapons Facility was testing the SH-34G to determine how near to an atomic blast the aircraft could work without incurring physical damage.

Still, the ASW mission remained the Sikorsky/Navy helicopter's most important role. The sub was continuing along its path of rapid technological improvement. Extending the capability of various members of the U.S. Navy ASW team was of paramount importance.

## MAJOR BREAKTHROUGH IN HELICOPTER TECHNOLOGY

Seven years of research and development by the U.S. Navy and Sikorsky Aircraft led to production of the world's first helicopter capable of operating day and night under instrument flight conditions. This aircraft, the SH-34J, was an improved version of the SH-34G. Its development was one of the most important achievements in the relatively short history of ASW helicopters. First flown in May, 1958, at the Naval Air Station in Corpus Christi,



Texas, the SH-34J differed from its predecessor by incorporating devices to measure ground speed and altitude with radar; automatic engine RPM controls; an automatic hover coupler; and improved flight instruments and cockpit arrangement. Now, with automatic stabilization equipment and the approach coupler, ASW helicopter pilots could descend to and remain in a hover automatically.

That same year was marked by the achievements of other Navy pilots flying Sikorsky helicopters. In July, Helicopter ASW Squadron One became the first in the Navy to fly 10,000 accident-free hours with SH-34's. Later, the SH-34J was evaluated at Panama City with towed sonar, bringing the Navy airborne MCM program one step closer to attaining its immediate goal of permanently obtaining an aircraft that could meet the requirements of the mission.

In August 1958, the Navy announced that it was developing a twin-turbine engine helicopter, with all-weather flying capabilities that would perform its ASW mission as no helicopter had been capable of doing. This helicopter was the Sikorsky-built SH-3A originally designated the HSS-2.

At the same time, the first SH-34J's were delivered to the U.S. Navy; the recipients were HS-6 at Ream Field, Calif. and HS-5 at Quonset Point, R.I. Other United States military services, foreign governments, and commercial operators were following the Navy's precedent by making versions of the SH-34 part of their helicopter fleets. (2,261 H-34's have been built since 1954. The Department of the Navy, including the Marine Corps, has received 881. The 341 that entered Navy service, alone, have recorded 600,000 flight hours.)



## FLIGHT OF THE SH-3A

The SH-3A made its first public flight in March, 1959, while undergoing exhaustive testing and development as the Department of Defense's first helicopter weapon system.

It was clear from the beginning of this program that nothing was to be overlooked. The pre-production testing and development backing this aircraft had to be unrivaled. As a result, each major system and component received thorough testing and close scrutiny. For example, the main rotor and blades were subjected to 4200 hours of whirl testing, plus thousands of hours of fatigue testing of 150 full scale specimens and static tests to fatigue ... the tail rotor and blades, 3500 hours of whirl testing, 150 full scale specimen fatigue tests, plus static tests ... and the main, intermediate, and tail gear boxes to 4300, 3400, and 4900 hours of endurance testing, respectively.

This unprecedented testing led to the aircraft's entering fleet service with lengthy overhaul intervals of 1000 hours and over for each of these components. Never before had this been accomplished in helicopter history. The program, itself, was backed by the development and construction of new helicopter testing equipment—such as the world's largest rotor test stand and a static jig capable of testing an entire aircraft and its systems. For the ASW mission, the SH-3A was equipped with an improved sonar system, the AQS-10, and navigation systems developed jointly by the Navy and Sikorsky. Sikorsky Aircraft's program responsibilities included not only designing and fabricating the airframe, but also procuring and testing major systems, such as sonar, electronic devices, navigation aids, and support equipment.

A feature then unique to the SH-3A was its armament equipment, which made the aircraft an active killer, and

more than just a passive hunter. For emergency water landings, it featured a boat hull and twin floats. Especially valuable to ASW pilots were the SH-3A's twin engines and single engine flight capability. For the first time in ASW history, helicopter pilots could cruise at 130 knots and fly a four-hour mission. Aboard ship, their helicopter was easily moved in and out of elevators and hangars because it incorporated an automatic blade folding system and folding tail pylon.



## CRANE RESEARCH

On the heels of the SH-3A came the S-60 crane, a gigantic helicopter built under research contract for the Navy. First flown on March 25, 1959, it provided the groundwork for the large, turbine-powered skycranes now in operation. The S-60 was used extensively in research mine countermeasures projects. It was instrumental in helping the Navy realize its concept of a self-sufficient, aerial mine sweeper in 1960 by becoming the first helicopter to carry, stream, tow, and recover Vermoor gear. The S-60 incorporated many of the major dynamic components of the S-56.

Navy helicopters were beginning to play an increasingly important role in space programs by 1960, when a U.S. Navy HO4S assigned to the Pacific Missile Range ship, *Haiti Victory*, made a dramatic recovery of the *Discoverer XIII* space capsule. The honor of retrieving the first orbited man-made object to return to earth intact went to Lt. Albert C. Pospisil, pilot; Lt. (j.g.) Arthur S. Anderson, copilot; BM 3/C Robert W. Carroll, diver; and AD1/C Clifford C. Allsup, plane captain.



## THE SH-3A ENTERS SERVICE

In the fall of 1961, the first five SH-3A's to enter fleet service were flown from Key West, Florida, to Ream Field, California, in the record-breaking flight time of 17 hours. At the same time more SH-3A's were assigned to HS-3 in Norfolk. While these aircraft were becoming operational, other S-61's were eclipsing world helicopter speed records. In December, the SH-3A broke the 3-, 100-, 500- and 1000-kilometer course records with speeds of 199.01, 182.8, 179.5, and 179.3 mph, respectively. Two months later, the SH-3A became the first helicopter to fly faster than 200 mph by dashing over a 19-kilometer course at 210.6 mph.

Another world helicopter record was added in 1965 when Commander James R. Williford, Lieutenant David A. Beil, and Airman Paul J. Bert flew an SH-3A non-stop for 2116 miles. The SH-3A, dubbed the Dawdling Dromedary, took off from the carrier *Hornet* off San Diego and flew to the carrier *Franklin D. Roosevelt* off Jacksonville, Fla. The 15-hour and 52-minute flight bettered the old distance record by 768 miles.

Speed, an essential element for the ASW helicopter, was not lacking in the SH-3A. But, as an integral member of the air, surface, and sub-surface ASW team, it had to have much more. And it soon proved that it did, when it joined the Navy's ASW squadrons in 1961 in time for operational exercises. While destroyers covered short range defensive positions, the SH-3A was able to fly rapidly to areas long distances from the carrier to hunt subs. While fixed-wing aircraft scanned the seas for subs, the SH-3A hovered motionless as a listening platform. Its twin-turbine engines now provided pilots with a margin of safety, and enhanced the all-weather, day and night operations it was performing.



Scott Carpenter. The Navy's role in this program was in no way small. For, it was a Navy SH-3A, manned by Cdr. J. M. Wondergem, pilot; Lt. Cdr. B.C. Young, copilot; and Lt. (j.g.) W. J. Shufelt, crewman, that recovered Carpenter from the sea, following his three-orbit flight on May 24. Fifty-six explorers have been recovered by H-3 aircraft since that day in 1962.

As in the case of the SH-34, the SH-3As and SH-3Ds were involved in countless rescues in Vietnam where, in dedicated SAR detachments, their call sign "Big Mother" became legend. Many of them were to pluck downed pilots from the hands of the enemy. Of the selfless acts of these crews, one that typifies the ability, strength of character, and devotion to duty of our naval aviators was that of the crew of an SH-3A from HS-6 in September, 1966. The plane commander, CDR Robert Vermilya, USN, facing overwhelming odds flew into intense enemy gunfire in Haiphong Harbor and snatched LCDR Tommy Tucker from the water and certain imprisonment before surrounding boats could capture him.

From the successes of the SH-3A evolved the SH-3D. Performance increased significantly in this later model as a result of installing two 1400 shp T58-10 turbo-shaft engines, which were growth versions of the 1250-shp powerplants of the SH-3A. The SH-3D transmission was uprated from 2300 to 2500 shp, allowing aircraft gross weight to increase from 18,000 to 20,500 lbs. A new fuel system and improved engine power management system gave pilots more time for the complex procedures of developing ASW tactics.

Currently the SH-3H, an outgrowth of the SH-3D and the latest member of the H-3 family, leads the Navy's helicopter ASW forces. For the ASMD mission, the aircraft is equipped with an electronic surveillance measures system (ESM), radar, and chaff dispensers. For its antisubmarine role, the SH-3H is rigged out with tethered sonar, sonobuoys, Magnetic Anomaly Detection gear (MAD), and ASW weapons. By adding advanced avionics to the SH-3, the Navy fleet gained an effective multi-sensor, multi-mission capability at low cost.

In May 1963--after ten years experimentation with various helicopters for Mine Countermeasures (MCM) operations--the Navy announced that it had selected the Sikorsky-built RH-3A as the first helicopter operationally assigned to mine-sweeping duty.

In 1971, CH-53A were modified to RH-53As and assigned to airborne mine countermeasures squadron twelve (HM-12) where they distinguished themselves clearing the harbors of North Vietnam.

The RH-53D followed the tradition established by the RH-3A and joined the Navy helicopter fleet in 1973. This giant workhorse, an improved member of the H-53 family, was developed specifically for the mine countermeasures mission by the Navy. In 1974, the RH-53Ds of HM-12 served in their primary role by sweeping the Suez Canal of mines. Commencing in February 1975, HM-12 will provide interim Vertical Onboard Delivery (VOD) of high priority goods to the fleet.

The RH-53D provides for towing and refueling the Mark 105 magnetic influence minesweep system. It also provides for streaming, towing, and retrieving the Mark 103 mechanical sweep system, and the Mark 104 acoustic sweep system. To meet the mission requirement, the RH-53D has increased basic design gross weight and alternate design gross weight.



External cargo hook capacity is increased to 25,000 lbs. In addition, built-in features include 650 gal. external auxiliary fuel tanks, air-to-air refueling probe, ship-to-air refueling capability, increased tow hook winch system capacity and a 600-lb. rescue hoist. The aircraft also has provisions for a self-contained navigation system.

## THE VERSATILE CH-53E

Another model in the H-53 class is the CH-53E, an improved version of the CH-53D, designed for the U.S. Marines and the U.S. Navy. With the addition of a third engine and a seventh rotor blade, the "Big E" will add heavy lift capability--double that of the CH-53D--to a combat-proven assault transport helicopter. It will be fully carrier-compatible and have automatic blade and pylon fold. It will be able to pick up another aircraft equal to its own weight and retrieve a damaged aircraft and transport it 50 nautical miles to safety.



The CH-53E will be able to quickly remove disabled aircraft from a carrier deck, and load heavy cargo rapidly using the wide rear ramp, the roller floor, and tie-down fittings in the cabin. Refueling may be done on shore or on deck using pressure or gravity equipment. With a high-density seating arrangement, the CH-53E will be able to transport 55 troops.

The CH-53E will allow full implementation of the Navy Vertical Onboard Delivery (VOD) system to provide the

fleet with efficient, expeditious, point-to-point movement of high priority supplies, parts and personnel on a scale never before attempted.

These changes are but a few programmed by the U.S. Navy to keep its Sikorsky helicopters operating at maximum mission effectiveness. For more than two decades, this has been the objective of the U.S. Navy-Sikorsky Aircraft working relationship ... mission effectiveness.

## SIKORSKY/U.S. NAVY HELICOPTERS

Model	Mission	First Flight	Powerplant	Fuselage Length	Normal Gross Weight (Lb)	Useful Load (Lb)	Cruise Speed (Kts)
R-4 (HNS)	Utility	Jan. 14, 1942	180 hp Warner	35' 5"	2,540	530	56
R-5 (HO2S)	Utility	Aug. 19, 1943	450 hp P & W	40' 10"	4,896	1,115	69
R-6 (HOS)	Utility	Oct. 15, 1943	245 hp Franklin	38' 3"	2,623	589	65
S-51 (HO3S)	Utility	Feb. 16, 1946	450 hp P & W	41' 2"	5,500	1,450	74
S-52 (HO5S)	Utility	Feb. 12, 1947	300 hp Franklin	27' 6"	2,700	875	79
S-55 (HO4S)	Utility	Nov. 10, 1949	700 hp Wright	42' 3"	7,500	2,250	74
S-56 (HR2S)	Research	Dec. 18, 1953	(2) 2,100 hp P & W	64' 11"	31,000	11,587	100
S-58 (SH-34G)	ASW	Mar. 8, 1954	1,525 hp Wright	46' 9"	13,000	4,900	84
S-58 (SH-34J)	ASW	Mar. 8, 1954	1,525 hp Wright	46' 9"	13,000	4,725	84
S-60	Research	Mar. 23, 1959	(2) 2,100 hp P & W	64' 3"	31,200	11,587	100
S-61 (SH-3A)	ASW	Mar. 11, 1959	(2) 1,250 shp GE	54' 9"	18,000	6,523	130
(RH-3A)	MCM	Feb. 2, 1965	(2) 1,250 shp GE	54' 9"	19,100	7,700	130
(SH-3D)	ASW	July 15, 1965	(2) 1,400 shp GE	54' 9"	20,500	8,700	130
(SH-3H)	ASW	April 5, 1972	(2) 1,400 shp GE	55' 3"	21,000	8,350	130
S-65 (RH-53D)	MCM	Dec. 21, 1972	(2) 3,925 shp GE	67' 6"	42,000	15,540	150
(CH-53E)	Utility	Mar. 1, 1974	(3) 4,380 shp GE	73' 5"	69,750	37,830	150

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